WHAT IS CLAIMED IS:

1. A method for producing a soluble protein domain comprising:

(a) preparing two or more DNA fragments by partially digesting a DNA coding for a protein,

(b) expressing a fusion protein which is coded on each of said DNA fragments fused with a DNA encoding a functional protein exhibiting a function,

(c) selecting the fusion protein exhibiting said function among two or more fusion proteins synthesized in step (b), and

(d) synthesizing the soluble protein domain in a cell-free system,

wherein said soluble protein domain is included in said fusion protein selected in step (c).

2. The method of claim 1, wherein said DNA fragments in step (a) are prepared by partially digesting the DNA coding for said protein and a DNA for a functional protein, with a DNA decomposing enzyme.

3. The method of claim 1, wherein said functional protein in step (b) is any one selected from the group consisting of an enzyme, a binding protein, a luminescent protein and a fluorescent protein, or a functional portion thereof.

4. The method of claim 3, wherein said fluorescent protein is a green fluorescent protein or a derivative thereof.

5. The method of claim 1, wherein said selection in step (c) is performed by transforming a recipient cell with each of said DNA fragments and the DNA of said functional protein, and selecting the clone which exhibits said function in the obtained transformants.

6. The method of claim 5, wherein said recipient cell is *Escherichia coli*.

7. The method of claim 1, wherein the fusion proteins are synthesized in a cell-free system, and wherein said selection in step (c) is performed by measuring the function of the expressed proteins.

8. The soluble protein domain synthesized by the method of claim 1.

9. A method for analyzing the three dimensional structure of a protein comprising:

synthesizing the soluble protein domain by the method of claim 1, and analyzing the three dimensional structure of said soluble protein domain by X-ray crystallography or NMR spectroscopy.

10. A method for producing a soluble protein domain comprising:

(a) constructing a expression vector which expresses a fusion protein with a green fluorescent protein or a derivative thereof, wherein said expression vector comprises a DNA coding for a protein and a gene for said green fluorescent protein or a derivative thereof,

(b) preparing two or more DNA fragments by partially digesting said expression vector with DNA decomposing enzyme,

(c) transforming *Escherichia coli* with each of said DNA fragments to obtain two or more transformed *Escherichia coli*,

(d) isolating a transformed clone that emits fluorescence among the transformed *Escherichia coli*,

(e) recovering the DNA from the isolated transformed clone, and

(f) synthesizing the soluble protein domain which is coded on the recovered DNA in a cell-free system.

11. A method for producing a soluble protein domain comprising:

(a) selecting a fusion protein from a plurality of fusion proteins containing a functional protein exhibiting a function, and

(b) synthesizing a soluble protein domain from the fusion protein selected from step (a).

12. The method of claim 10, wherein said functional protein contains a protein encoded by a DNA fragment of a partially digested DNA.

13. A method for producing a soluble protein domain comprising:

(a) preparing an expression vector comprising a DNA coding for a protein and a DNA coding for a functional protein;

(b) treating said vector by using a decomposing enzyme and forming two or more vectors, each vector comprising a fragment of said DNA coding for a protein and the DNA coding for a functional protein;

(c) expressing a fusion protein which is coded on each of said vectors fused with a DNA encoding a functional protein exhibiting a function;

(d) selecting the fusion protein exhibiting said function among two or more fusion proteins synthesized in step (c);

(e) synthesizing the soluble protein domain in a cell-free system, wherein said soluble protein domain is included in said fusion protein selected in step (d).

14. The method of claim 13, wherein the selection of step (d) is performed by transforming a recipient cell with the expression vector comprising each of said DNA fragments and the DNA of said functional protein, and selecting the clone which exhibits said function in the obtained transformants.